

Minutes
Electrical Power Working Group
Wednesday, 13 February 2002
Hyatt Regency New Orleans
New Orleans, LA

Chairpersons presiding: Bob Luther; Lex Products Corp.; principal; producer
Ken Vannice; Colortran (Leviton Manufacturing Co., Inc.); principal; producer

Recording secretary: Karl G. Ruling; ESTA

Members attending: Michael Amorelli; AC Power Distribution Inc.; principal; general interest
George Long; Aggreko Event Services; principal; user
Arnold Tang; Arnold Tang Productions; observer; general interest
Steve Terry; Electronic Theatre Controls, Inc.; principal; producer (change of voting status from observer to principal at this meeting)
Michael Klein; Environmental System Design; principal; general interest (Attended as a visitor. Joined at the end of the meeting.)
Edwin S. Kramer; IATSE, Local 1; principal; user
Roger Lattin; IATSE Local 728; principal; user
Richard Thornton Brown; Zero 88 Ltd. (i Light Group PLC); observer; producer
Louis Bradfield; Louis Bradfield; individual; user
W. G. Krokaugger P.E.; Mole-Richardson Co.; principal; producer
William N. Masten; SMS Inc. / PGS LLC; principal; producer
Michael Lay; Strand Lighting (Strand Lighting Ltd.); principal; producer
Brian Dowd; TMB; principal; producer
Richard Wolpert; Union Connector Company; observer; producer

Visitor: Bill Maiman; ESTA

1 Opening remarks

Ken Vannice called the meeting to order at 08:04 and welcomed all to New Orleans.

2 Attendance and membership

2.1 Introduction of those present and taking attendance

Vannice held up the chartreuse attendance sheet and asked all present to sign in. He directed visitors to sign in on the visitor sign-in sheets. He then asked those present to introduce themselves.

2.2 Determination of quorum

Vannice noted that enough voting members were present to support a supermajority vote. A quorum was definitely present.

2.3 Recognition of alternate voting members

No alternates were present.

2.4 Requirements for membership

Vannice stated that working group membership is open to all who are materially affected by the work of the group. He noted that there is an attendance requirement for voting members. Habitual absentees will be demoted to non-voting, observer status, although they may return to voting status if they attend meetings and request a change back to voting status.

2.5 Processing of new membership requests

Bob Luther read the membership applications:

Gian Carlo C. Bartolotti of Ibeam SP/Banco de Eventos applied as an observer in the user interest category.

Art Wanuck of M.C. Lights & Manufacturing Ltd. applied to represent the Ontario Film & Television Prod. Electrical Comm. as an observer in the producer interest category.

Bob Luther said that the interest category Wanuck had indicated (producer) was inappropriate because he is asking to represent the Ontario film & television industry. Luther said that his interest category would be recorded as general interest.

Steve Terry of Electronic Theatre Controls asked to have his voting status changed from observer to principal.

Eddie Kramer moved that the applications from Bartolotti and Wanuck be accepted and that Steve Terry be granted principal voting status. The motion was seconded. The motion was accepted unanimously by a show of hands.

The complete consensus body for this meeting, including those not present, was thus:

Name	Company	Representing	Voting status	Interest cat.
Michael Amorelli	AC Power Distribution Inc.	AC Power Distribution Inc.	P	G
James Davey	AC Power Distribution Inc.	AC Power Distribution Inc.	A	G
Jeff deRecat	Advanced Devices, Inc.	Advanced Devices, Inc.	P	P
Bud Toly	Advanced Devices, Inc.	Advanced Devices, Inc.	A	P
George Long	Aggreko Event Services	Aggreko	P	U
Wolfgang Hofheinz	Bender GmbH & Co. KG	Bender GmbH & Co. KG	P	P
Joe Boardman	Bender Inc.	Bender GmbH & Co. KG	A	P
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	P	P
Roger Lattin	IATSE Local 728	I.A.T.S.E. Local 728	P	U
R. Bruce Prochal	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	A	U
Patric J. Abaravich	IATSE Local 728	I.A.T.S.E. Local 728	A	U
Edwin S. Kramer	IATSE, Local 1	IATSE, Local 1	P	U
Ken Vannice	Colortran	Leviton Manufacturing Co., Inc.	P	P
Mitchell Stein	Leviton Manufacturing Co., Inc.	Leviton Manufacturing Co., Inc.	A	P
Tim Bachman	Leviton/Colortran	Leviton Manufacturing Co., Inc.	A	P
Bob Luther	Lex Products Corp.	Lex Products Corp.	P	P
Louis Bradfield	Louis Bradfield	Louis Bradfield	I	U
W. G. Krokaugger P.E.	Mole-Richardson Co.	Mole-Richardson Co.	P	P
Brian Parker	Mole-Richardson Co.	Mole-Richardson Co.	A	P
Tim Cox	PLASA	PLASA	P	G
Robert Barbagallo	Proximo Inc.	Proximo Inc.	P	G
William N. Masten	SMS Inc. / PGS LLC	SMS Inc. / PGS LLC	P	P
Richard A. Prey	SMS Inc. / PGS LLC	SMS Inc. / PGS LLC	A	P
Michael Lay	Strand Lighting	Strand Lighting Ltd.	P	P
Brian Dowd	TMB	TMB	P	P
Colin Waters	TMB	TMB	A	P
Mitch Hefter	Entertainment Technology (Genlyte Thomas Group)	USITT	P	G
				9 P 4 U 4 G

3 Approval of the minutes from the previous meeting

Vannice asked if anyone would like to move that we approve the draft minutes of the last meeting. Steve Terry moved that the minutes be approved. The motion was seconded. The motion was accepted by a unanimous show of hands.

4 Reading of the call for patents

Vannice read the following aloud:

"ESTA intends to publish no standard that contains protected intellectual property, unless that property can be licensed by anyone for a reasonable fee. ESTA uses a process of open patent disclosure to implement this intent. ESTA does not conduct patent searches and does not warrant that its standards contain no protected intellectual property.

"In keeping with the open disclosure policy, I ask if anyone present wishes to notify the working group of the existence of a patent or copyright that might protect material in a standard being developed by the working group. You need not be the holder of the patent or copyright in order to notify the working group of its existence."

No issues brought to the attention of the working group.

5 Reading of the anti-trust statement

Vannice read the following aloud:

"The ESTA Board of Directors, the Technical Standards Committee, and the leadership of this working group will reject or nullify any actions that unlawfully restrain trade. Anyone who feels that such an action is being or has been taken is requested to bring that matter to the attention of the chair immediately. Anyone who feels that actions in restraint of trade have been taken and not properly annulled is requested to notify the TSC chair or ESTA president immediately.

"ESTA legal counsel has informed us that violations of the anti-trust laws can have serious consequences. Individuals engaged in certain unlawful conduct can be found criminally liable. An individual convicted of a criminal violation of the Sherman Act may be fined as much as \$100,000 and imprisoned for up to three years. An easy to read pamphlet describing restraint of trade issues is available from the Technical Standards Manager."

Bill Maiman, the Assistant Technical Standards Manager, waved several of the easy-to-read pamphlets above his head.

No anti-trust issue were brought to the attention of the chair.

6 Approval of agenda

Vannice asked if there were any changes or additions to the agenda. Steve Terry moved that the agenda be accepted as written. The motion was seconded. The motion was approved unanimously with a show of hands.

7 Old business - task group reports

7.1 EMC task group

Vannice reported that not a lot has happened recently on the EMC front. He noted that it was recently announced that an organization of power supply producers is now working more closely with CENELEC in Europe. He felt that this should help keep the adoption of tough power line harmonics standards at the EC level under control. He also reported that the USCCEMC will have a meeting in New York. This group still wants to get EN 61000-3-2 withdrawn. It wants to get rid of the notion of horizontal standards or, failing that, weaken it.

7.2 Problems with pin connectors task group report

Brian Dowd distributed a letter sent to him by Ron Dahlquist [appended to these minutes] and reported that his task group has found that the only significant issues seem to be with the 100A connectors. There is no consensus that there is a problem with 20A connectors. The Hollywood users seem to feel that 100A connectors have a compatibility problem. There appear to be some manufacturers who were not even aware that there was a USITT standard for these connectors.

Steve Terry inquired about why the standard seems to be unknown and unused by some manufacturers. Ken Vannice reviewed the history of the USITT standard. The USITT standard exists, but it is not used by UL. Mr. Kurtin of UL-NY denied ever getting a copy of the standard.

There was a discussion of the issues identified in Ron Dahlquist's letter. The USITT standard, even if it were used, might not address the compatibility problems. It does not adequately address the specification of the female, or issues such as what "reliably mate" means or how this should be measured.

The consensus was that the split male pin scheme is fundamentally flawed. Reliable connector designs use a split female and a solid male. However, we have been stuck with split males because that is the way it has been done, and there is too large an installed base.

Vannice said that at that at this evening's USITT engineering commission meeting they will discuss what to do with the pin connector standard, whether it needs to be revised, needs typos fixed, needs to be an ANSI standard, or what. Terry said that whatever the outcome, UL needs to be using this standard as part of the requirements for the UL listing of pin connectors. The existing listings on pin connectors should be withdrawn until the connectors are re-tested.

There was a discussion of the use of banded cable with 100A connectors, insulation ratings, and test conditions. Vannice instructed Brian Dowd's committee to draft a recommendation to USITT as to how they would like the Engineering Commission to proceed with revising or fixing the standard, or writing a recommended practice document. He said he would take the concerns voiced at this meeting today to the USITT meeting tonight.

7.3 Reasons for NEC rules article

Vannice reported that he had a second draft of an article written, but that it needs revision. He also said that the above discussion of banded cable has also given him more to write about.

7.4 BSR E1.18 portable feeder cable selection and use task group

Eddie Kramer reported that they had had a power feeder breakfast, which was entertaining but not particularly productive. He proposed that they have another meeting on the Thursday before the EPWG meeting in Texas.

There was a discussion of how to move forward. Steve Terry advised that one of the first tasks should be to create an outline listing the topics to be covered in the document to be used to assign homework to task group members in order to complete the document. This will help keep the group on task.

7.5 BSR E1.19 GFCI task group

Bill Masten presented the draft document (EP/2001-7012r1). There was discussion as to whether this document, which is an outline, represents an acceptable list of topics to be covered in the E1.19 standard.

Roger Lattin suggested that hand-held devices should be covered as situations where GFCI may be appropriate.

There was a discussion of the purpose and need for paragraph I B. There was additional discussion of the need in III for listings of places where GFCI is not required but is recommended or might be a wise choice.

Terry suggested that people should look at the book Overcurrents and Undercurrents: All about GFCIs and AFCIs by Earl W. Roberts [available from Reptec at 860-536-4496] and the technical report IEC 479-1, "Effects of current on human beings and livestock" report.

Kramer moved that we thank the task group for its hard work and approve the direction in which they are going. The motion was seconded. The motion was approved unanimously with a show of hands.

Lattin moved that an email reflector be set up for the epwg@esta.org and a gfci@esta.org. The motion was seconded. There was discussion of how important it is for people on a reflector to reply. The motion was approved unanimously by a show of hands except for one abstention.

Steve Terry suggested that the task group should now start breaking up the document into sections to be written by particular task group members.

7.6 BSR E1.16 configuration standard for HMI power cables status report

Karl Ruling reported that no comments had been received during the public review.

Steve Terry moved that we accept BSR E1.16 (EP/2000-7007r4) as an American National Standard, and to forward this recommendation to the Technical Standards Committee. The motion was seconded. By roll call ballot, the motion was accepted with a supermajority of 12 out of a possible 17 voting members voting in favor. Five voting members were not present. There were no negative votes and no abstentions.

Name	Company	Representing	Voting status	Int. cat.	Accept	Accept in principle	Accept in part	Reject	Abstain
Michael Amorelli	AC Power Distribution Inc.	AC Power Distribution Inc.	P	G	X				
Jeff deRecat	Advanced Devices, Inc.	Advanced Devices, Inc.	P	P					
Bud Toly	Advanced Devices, Inc.	Advanced Devices, Inc.	A	P					
George Long	Aggreko Event Services	Aggreko	P	U	X				
Wolfgang Hofheinz	Bender GmbH & Co. KG	Bender GmbH & Co. KG	P	P					
Joe Boardman	Bender Inc.	Bender GmbH & Co. KG	A	P					
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls	P	P	X				
Edwin S. Kramer	IATSE, Local 1	I.A.T.S.E. Local 1	P	U	X				
Roger Lattin	IATSE Local 728	I.A.T.S.E. Local 728	P	U	X				
Ken Vannice	NSI Corporation	Leviton Manufacturing Co., Inc.	P	P	X				
Bob Luther	Lex Products Corp.	Lex Products Corp.	P	P	X				
Louis Bradfield	Louis Bradfield	Louis Bradfield	I	U	X				
W. G. Krokaugger P.E.	Mole-Richardson Co.	Mole-Richardson Co.	P	P	X				
Tim Cox	PLASA	PLASA	P	G					
Robert Barbagallo	Proximo Inc.	Proximo Inc.	P	G					
William N. Masten	SMS Inc. / PGS LLC	SMS Inc. / PGS LLC	P	P	X				
Michael Lay	Strand Lighting	Strand Lighting Ltd.	P	P	X				
Brian Dowd	TMB Associates (NJ)	TMB Associates	P	P	X				
Mitch Hefter	Entertainment Technology (Genlyte Thomas Group)	USITT	P	G					
					12				

Kramer moved that this standard be published on the ESTA website for free download and that it also be offered to PERA for publication on its website. The motion was seconded. The motion was approved unanimously by a show of hands.

8 New business

None.

9 Other business

Michael Klein of Environmental Systems Design, who had been sitting in on the meeting as a visitor, applied as a principal in the general interest category. Bob Luther asked him to explain his business, which he did. Steve Terry moved that Michael Klein's application be accepted. The motion was seconded. The motion was approved unanimously by show of hands.

Vannice asked for other business. There was none.

10 Schedule for future meetings

Ken Vannice announced that the next meeting will be Friday, May 3 at the Dallas/Ft. Worth Marriott South (not North of the airport) from 08:00 to noon. Vannice noted that the group doesn't need any visual aids: no flip chart, no overhead projector, no screen, etc.

Vannice announced that the following meeting will be Friday, July 26 from 08:00 to noon, again at the Marriott South.

11 Adjournment

Bob Luther suggested that task groups take the time made available by the early finish of the working group's business to meet this morning.

Roger Lattin moved that the meeting adjourn. The motion was seconded. The motion was approved by a show of hands. Vannice declared the meeting adjourned at 10:19.

February 8, 2002

Brian Dowd
TMB Associates

Dear Brian:

As per our phone conversation I am not able to attend the electrical Power Working Group meeting in New Orleans, please give the group my apologies.

The following are my findings with regards to the 3-pin plug and connector overheating problems.

For the most part the 100 amp plugs overheat due to poor electrical contact from loose pin and sleeve fit up. The male pins are split and are exposed to physical damage from being smashed together when dropped.

Another problem is that pins and sleeves from different manufacturers do not always make a good electrical connection; when interchanged with each other they may physically fit tight with the alignment, but do not make a good electrical connection.

Even though the USITT Standard exists, not all manufacturers adhere to the standard, and the standard itself is too vague.

At the last LDI trade show there were at least 6 manufacturers of 3-pin connectors, 5 were U.L. listed, one was only U.L. recognized two manufacturers were unaware of the USITT Standard, and none were tested for compatibility with other connectors.

One of the problem areas with the USITT Standard is the female receptacle contact specification without a fixed dimension, the standard states; "the receptacle's contacts shall be sized so as to function reliably with the full range of allowable pin diameters and pin slot widths."

This obviously cannot be physically accomplished especially with solid receptacle sleeve contacts. In order to accomplish the task of "reliability" one unit would have to be tested with every connector on the market.

The word "reliably" is like the word "beauty" , it's in the eye of the beholder and has no reference tolerances or heat rise that may occur between two different manufacturers plugs that are not compatible by electrical standards.

In order to have a realistic standard, both the male pin and female pin must have suitable dimensions and acceptable tolerances along with a go-no go gauge for testing plugs and connectors.

The USITT reference block only gives a gauge for alignment of pins and does not address the pin and sleeve tolerances.

The unfortunate fact we must accept is that the pin and sleeve device should be made with the male pin solid and the female sleeve (receptacle) split. We cannot change history and must move forward with changes that make better devices for the industry .

The USITT Standard only addresses the male pin being split and does not address the female receptacle being split due to the fact that some manufacturers have made solid receptacles in the past.

Plugs and connectors can be made to any specification as long as they mate together . They are not required to be compatible with any other connector by U .L. Standards. Other issues must also be considered such as types of cable connections; stakon or self set screw type, soldered or not soldered along with recommended wiring practices.

Another problem I discovered is that most plugs and connectors are rated at 100 amps using #2 cable, most 100 amp plugs and connectors are wired with #4 cable; so what are these plugs really rated for?

We need to have the cooperation of all the plug manufacturers in order to make an appropriate ANSI standard. I suggest we ask all of the manufacturers to submit assembly instruction sheets to start the process.

Submitted by Ron Dahlquist

**Electrical Power Working Group Membership and Contact Information at the End of the 13
February 2002 Meeting**

Name	Company	Representing	Voting status	Int. cat.
Michael Amorelli	AC Power Distribution Inc.	AC Power Distribution Inc.	P	G
James Davey	AC Power Distribution Inc.	AC Power Distribution Inc.	A	G
Jeff deRecat	Advanced Devices, Inc.	Advanced Devices, Inc.	P	P
Bud Toly	Advanced Devices, Inc.	Advanced Devices, Inc.	A	P
George Long	Aggreko Event Services	Aggreko	P	U
Arnold Tang	Arnold Tang Productions	Arnold Tang Productions	O	G
David Evaniew	B. I. M. Limited	B. I. M. Limited	O	P
Wolfgang Hofheinz	Bender GmbH & Co. KG	Bender GmbH & Co. KG	P	P
Joe Boardman	Bender Inc.	Bender GmbH & Co. KG	A	P
Lee J. Bloch	Bloch Design Group Inc.	Bloch Design Group Inc.	O	G
Jeffrey Measley	Crouse-Hinds Molded Products	Crouse-Hinds Molded Products Inc.	O	P
Ron Dahlquist	Dadco	Dadco	O	P
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	P	P
Michael Klein	Environmental System Design	Environmental System Design	P	G
Trevor Forrest	Helvar Lighting Control	Helvar Lighting Control	O	P
Edwin S. Kramer	IATSE, Local 1	I.A.T.S.E. Local 1	P	U
Roger Lattin	IATSE Local 728	I.A.T.S.E. Local 728	P	U
R. Bruce Prochal	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	A	U
Patric J. Abaravich	IATSE Local 728	I.A.T.S.E. Local 728	A	U
Richard Thornton Brown	Zero 88 Ltd.	i Light Group PLC	O	P
Gian Carlo C. Bartolotti	Ibeam SP / Banco de Eventos	Ibeam SP / Banco de Eventos	O	U
Bill Kanne	Illumination Dynamics	Illumination Dynamics	O	U
Kevin Stolpe	Illumination Dynamics	Illumination Dynamics	O	U
Jose J. Flores	Kino Flo, Inc.	Kino Flo, Inc.	O	P
Don Gray	Kohler Event Services	Kohler Co.	O	U
Ken Vannice	Colortran	Leviton Manufacturing Co., Inc.	P	P
Mitchell Stein	Leviton Manufacturing Co., Inc.	Leviton Manufacturing Co., Inc.	A	P
Tim Bachman	Leviton/Colortran	Leviton Manufacturing Co., Inc.	A	P
Bob Luther	Lex Products Corp.	Lex Products Corp.	P	P
Louis Bradfield	Louis Bradfield	Louis Bradfield	I	U
Jim Holladay	Luxence	Luxence	O	G
Phil Fram	Marinco	Marinco	O	P
Hiroshi Kita	Marumo Electric Co., Ltd.	Marumo Electric Co., Ltd.	O	P
W. G. Krokaugger P.E.	Mole-Richardson Co.	Mole-Richardson Co.	P	P
Brian Parker	Mole-Richardson Co.	Mole-Richardson Co.	A	P
Art Wanuch	M.C. Lights & Manufacturing, Ltd.	Ontario Film & Television Prod. Electrical Comm.	O	G
Tim Cox	PLASA	PLASA	P	G
Mac Perkins	PNTA	PNTA Inc.	O	G
Paul Menetrey	Power Guard Systems, LLC	Power Guard Systems, LLC	O	G
Robert Barbagallo	Proximo Inc.	Proximo Inc.	P	G
Paul F. Mardon	Pulsar Ltd.	Pulsar Ltd.	O	P
Douglas Franz	QVC Network	QVC Network	O	U
Andre Broucke	ADB - TTV Technologies	Siemens	O	P

Name	Company	Representing	Voting status	Int. cat.
William N. Masten	SMS Inc. / PGS LLC	SMS Inc. / PGS LLC	P	P
Richard A. Prey	SMS Inc. / PGS LLC	SMS Inc. / PGS LLC	A	P
Michael Lay	Strand Lighting	Strand Lighting Ltd.	P	P
Andy Topinka	Technical Group Services, Inc.	Thea & Schoen, Inc.	O	G
Colin Waters	TMB	TMB	A	P
Brian Dowd	TMB	TMB	P	P
Richard Wolpert	Union Connector Company	Union Connector Company	O	P
Mitch Hefter	Entertainment Technology (Genlyte Thomas Group)	USITT	P	G
Eckart Steffens	SOUNDLIGHT	VPLT	O	G
Bruce Whitehead	Whitehead Engineering Services	Whitehead Engineering Services	O	G
		voting members		9 P 5 G 4 U
		non-voting members		11 P 9 G 4 U

Voting Status

- P Principal voting representative for a company or organization
- A Alternate voting representative for a company or organization
- I Individual representing no organization other than himself or herself
- O Observer; non-voting

Interest Categories

- P Producer (manufacturer) of power distribution equipment
- U User of power distribution equipment
- G General interest in power distribution equipment